Attorney Docket # 5367-249PUS

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Simon BLÜMEL

Serial No.: 10/585,175

Filed: July 6, 2007

For: Optoelectronic Module, and Method for the Production Thereof

Examiner: SENE, Pape A.
Group Art: 2812

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PRE-APPEAL BRIEF REQUEST FOR REVIEW

SIR:

This is a Request for a Panel Review of Issues on Appeal in accordance with the Office Gazette Notice dated July 12, 2005 and is filed concurrently with a Notice of Appeal. Arguments supporting the Request are found on pages 2-5. This Request is filed in response to the Final Office Action dated March 6, 2009, wherein the Examiner maintained that claims 1-4, 6-13, and 16-17 are unpatentable as obvious from U.S. Patent Appl. Pub. No. 2002/0057057 (Sorg) in view of U.S. Patent No. 6.130,448 (Bauer), and claims 5, 14, and 15 are unpatentable as obvious from Sorg in view of Bauer, and further in view of U.S. Patent No. 5,556,809 (Nakagawa).

ARGUMENTS

The combination of Sorg and Bauer fails to teach or suggest the following features of claim 1, namely, "wherein the optical device and the semiconductor component are fixed relative to one another and pressed against one another to squeeze the connecting layer arranged therebetween" and "wherein the connecting layer, when squeezed, is configured to generate an opposing force that strives to press the optical device and the radiation coupling area apart.

"Pressed against one another" means that the optical device 3 and the semiconductor component 2 are held permanently in a state pressed against one another by a fixing device (i.e., mounting bars 8 and nuts 9) to squeeze, and consequently deform, the connection layer 6 (see paragraph [0010] of Applicant's published specification). The connection layer 6, in response to being squeezed by the optical device 3 and semiconductor component 2, generates an opposing force that pushes back against the semiconductor component 2 and the optical device 3 to push the optical device 3 away from the radiation coupling area 16 of the semiconductor component 3 (see paragraph [0011] of Applicant's published specification).

The connecting layer 6 is configured such that the force it generates prevents to the greatest possible extent any formation of air gaps between the connecting layer and the adjoining interfaces. This applies in particular to an entire operating temperature range of the module and to any action of additional deforming forces on the connecting layer, such as, for instance, vibrations or centrifugal forces (see paragraph [0012] of Applicant's published specification). The connecting layer 6 includes a material which has a higher strength than a conventional gel and which is not flowable over the entire operating temperature range of the optoelectronic module (see paragraph [0013] of Applicant's published specification).

Thus, the invention recited in claim 1 effectively compensates for fluctuations in the distance between the semiconductor component and the optical device, which may occur because of temperature fluctuations in combination with the different expansion coefficients of the materials of the semiconductor component and the optical device. If the separation or distance between the optical device and the semiconductor component increases, the compressed connecting layer expands and thus minimizes the risk of an air gap forming between the semiconductor component and the radiation coupling area (see paragraph [0014] of Applicant's published specification).

Sorg discloses an LED light source that includes a lead frame 5 and body 1 with a recess 1A in which a liquid resin filling 3 is disposed. The LED light source of Sorg further includes a

lens 4 disposed in the recess 1A such that the resin filling 3 is displaced in the recess 1A to accommodate the lens 4. The resin filling 3 is thus disposed between lens 4 and the lead frame 5 and/or the LED 2 (see Fig. 2 and paragraphs [0046] and [0049] of Sorg).

The final Office Action cites Fig. 2 and paragraph [0046] of Sorg as teaching that the LED 2 and lens 4 of Sorg are fixed relative to one another and that the resin filling 3 (which allegedly corresponds to Applicant's connecting layer 6) is disposed therebetween and fixed relative to the LED 2 and the lens 4. The Examiner, however, fails to cite any portion of Sorg as teaching an optical device and a semiconductor component pressing against one another to squeeze a connecting layer arranged therebetween, or that the connecting layer, when squeezed, is configured to generate an opposing force that strives to press the optical device and the radiation coupling area apart", as recited in Applicant's claim 1.

Nothing in the cited passages of Sorg or anywhere in the disclosure of Sorg teaches or suggests that the lens 4 and the LED 2 are pressed together to squeeze the resin filling 3. Instead, the resin 3 of Sorg simply sits on top of the LED 2, and the lens 4 sits on top of the resin 3. The resin 3 of Sorg is simply displaced within the recess 1A to accommodate the lens 4. Also, Sorg does not teach or suggest that the resin is compressed or generates a force opposing a compression, which presses back against the LED 2 and the lens 4. Sorg simply teaches that the forces applied to the LED 2, the resin 3, and the lens 4 are in a state of equilibrium.

Specifically, Sorg states that "[t]he amount of resin material 3 with which the recess 1A is filled must be set as accurately as possible in such a way that the missing volume up to the rim of the recess 1A corresponds to the displacement volume of the section of the lens 4 forming the concave underside 4A" (see paragraph [0050] of Sorg). After the insertion of the lens 4 into the recess 1A, the resin filling is cured (see paragraph [0049] of Sorg).

As shown in Fig. 2 of Sorg, the lens 4 has a shape that exactly fits into the recess 1A. After the lens 4 is inserted into the recess 1A it is in a well-defined and fixed position in the upper part of the recess. In other words, lens 4 can be inserted into the recess 1A only up to a certain depth and cannot be pressed or forced further downwards into the recess 1A. Thus, a well-defined volume is formed by the lower part of the recess 1A and the underside 4A of the lens 4. Sorg explicitly emphasizes that the amount of resin material 3 that is filled into the recess 1A is set as accurately as possible so that after the insertion of the lens 4, the resin filling 3 exactly fills this volume, which is bounded in part by the recess 1A and the underside 4A of the lens 4. Consequently, the resin filling 3 is formed into a shape that is the compliment of the opposing face of the lens 4. The resin 3 is not compressed, so the resin does not generate an

opposing force. Further, after the liquid resin forms the curved shape matching the lens 4, the resin filling 3 is cured and is, therefore, not deformable.

Applicant's connecting layer 6 is not simply disposed between the semiconductor component 2 and the optical device 3, but is <u>compressed</u> (and thus deformed) between the semiconductor component 2 and the optical device 3. In other words, an additional force is applied to the semiconductor component 2 and the optical device 3. The compressed deformable connecting layer 6 generates an opposing force against the component 2 and optical device 3.

Bauer discloses an optical sensor package that includes an optical sensor 22 attached to the top side of a base substrate 28 (see Fig. 2, and col. 5, lines 1-3 of Bauer). A seal material 46 surrounds the optical sensor 22 of Bauer. A window 48 is bonded to the base substrate 28 of Bauer in a spaced-apart relationship. The spacing distance is determined by the seal material 46 (see col. 5, lines 34-40 of Bauer). A cavity 52, which is formed and enclosed by the base substrate 28, the seal material 46, and the window 48, is filled with an optically transparent curable resin. The resin may be self curing of may be cured by exposure to heat, ultraviolet light, an electron beam, or the like (see col. 5, line 65 to col. 6, line 2 of Bauer).

The Office Action cites Figs. 2 and 3, col. 5, line 63 to col. 6, line 2, and col. 9, lines 58-67 of Bauer as teaching Applicant's recited connecting layer 6, which allegedly corresponds to the epoxy filling the cavity 52 of Bauer. However, the Office Action fails to cite any specific portion of Bauer as teaching an optical device and a semiconductor component <u>pressing</u> against one another <u>to squeeze</u> a connecting layer arranged therebetween, or that the connecting layer, when squeezed, is <u>configured to generate an opposing force</u>..." as recited in claim 1.

The passages at col. 5, line 63 to col. 6, line 2 of Bauer simply disclose that the various components form a cavity filed with a resin. There is no teaching or suggestion that the window 48 and the optical sensor 22 are <u>pressed</u> together to compress the resin such that the resin produces an opposing force. Instead, the resin simply sits on top of the optical sensor 22, while the window 48 is supported by the seal material 46. Similarly, the passages at col. 9, lines 58-67 of Bauer simply disclose how the seal material 46 and the window 48 are attached to the base substrate 28 to produce the cavity 52. Here too, there is no teaching of compressing the resin. Consequently, Bauer fails to remedy the above-described deficiencies of Sorg.

In response to Applicant's arguments, the Examiner states that the applicants are being their own lexicographer by defining the phrase "the optical device and the semiconductor component are pressed against one another" as "the optical the optical device and the semiconductor component are held permanently in a state pressed against one another, counter to

the force of the connecting layer, by a fixing device". The Examiner asserts that this definition brings in a third limitation, namely, "a fixing device" for squeezing the connecting layer, which is not recited in claims 1 and 10. Based on this reasoning, the Examiner finds that Sorg in view of Bauer discloses squeezing the connecting layer.

Claim 1 specifically recites that "the optical device and the semiconductor component are <u>pressed</u> against one another", (i.e., a pressing force is applied). Thus, there inherently is, and must be, something that <u>presses</u> the optical device and the semiconductor component against one another to <u>squeeze</u> a connecting layer. The connecting layer, when squeezed, is <u>configured to generate an opposing force</u>. Thus, "a fixing device" need <u>not</u> be explicitly recited.

In view of the foregoing, Applicant submits that Sorg and Bauer, whether taken alone or in combination, fail to teach or suggest the subject matter recited in independent claim 1.

Claim 10 recites limitations similar to claim 1 and is, therefore, patentably distinct over Sorg and Bauer for at least those reasons discussed above with respect to independent claim 1.

Claims 2-4, 6-9, 11-13, and 16-17 depend from independent claims 1 and 10 and are, therefore, also patentable over Sorg and Bauer.

Nakagawa fails to remedy the above-described deficiencies of Sorg and Bauer. Therefore, claims 5, 14, and 15, patentable over Sorg, Bauer, and Nakagawa.

In view of the foregoing, reconsideration and withdrawal of all rejections, and allowance of all pending claims is respectfully solicited.

Respectfully submitted,
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